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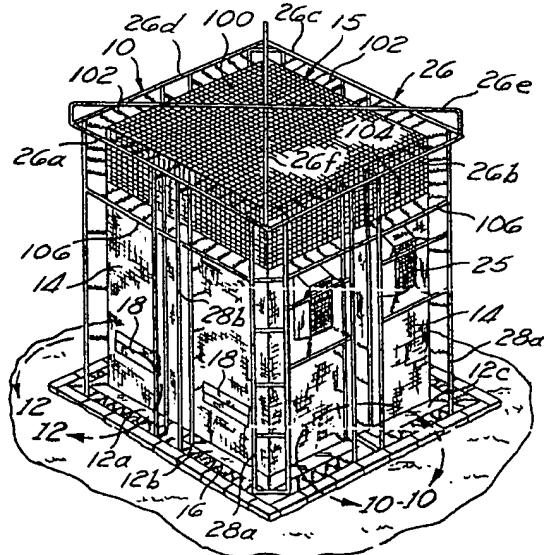
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(54) Exercise structure and ball game.

(57) A structure for use as an exercise compartment and a method for playing a ball game therein is disclosed. The structure has a horizontal rebound surface which is supported above the ground and has means for enclosing the air space above said surface to form a cell, said cell being of a size suitable for enclosing at least one human using said surface as a spring-board for exercise or for playing the ball game.



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EXERCISE STRUCTURE AND BALL GAME

This invention is related to exercise devices and games associated therewith.

The trampoline is well known as an exercise device. 5 Traditionally, a trampoline is formed from a sheet of material such as canvas which forms the trampoline bed and which is attached to a rigid support frame by elongate elastic means such as springs. The sheet of material is therefore resiliently supported above the ground in a 10 horizontal position, and functions as a springboard for the user. In using the trampoline, one jumps up and down on the bed and, with practice, can perform acrobatic feats in mid-air above the bed.

The bouncing form of exercise, as on a trampoline, is 15 well known as one of the most beneficial of exercises. This is due to the fact that, in jumping up and down on the resilient rebound surface, gravitational forces are exerted upon the body of the user, putting resistance on virtually every cell and each cell resists the pull of the 20 gravitational or "G" forces similar to large muscle groups resisting weights. The pulse rate is increased as rapidly as when running, and the lungs and cardiovascular system are developed. In addition, the exercise is excellent for reducing and strengthening the stomach and waist as well 25 as developing whole body coordination and timing and developing aerial balance and equilibrium. This form of exercise affects all portions of the body equally and does not put excessive stress upon the joints. Thus, there is no tendency to produce inflammation within the joints, or 30 bursitis, such as is commonly incurred in a sport such as tennis, and which is referred to as "tennis elbow".

An important parameter of trampolines which allows one to perform such gymnastics will be designated "rebound factor" for the purposes of this specification. Rebound 35 factor as herein defined is a percentage of the distance an object will be rebounded after falling onto the bed

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from said distance. Rebound factor therefore is a function of the weight of the object as well as the spring of the bed. Typically, a trampoline will have a rebound factor of about 50% for an average human being. Thus, if
5 an average adult were to fall 10 feet onto a trampoline, he would be rebounded about five feet into the air.

Although the trampoline offers great enjoyment and exercise for the user, it also poses significant dangers.

Many injuries have resulted in using a trampoline from
10 the user falling from the bed onto the ground below or falling onto hard objects such as the support frame or springs. Also, due to the construction of the trampoline, it is quite easy for the user's arm or leg to slip between the support frame and the bed which can cause severe
15 injury.

Games have been created for play on a trampoline. One of these games involves a volleyball-type net which is suspended above the trampoline bed. The game is then played in a volleyball-type fashion, upon the trampoline
20 with two or more players hitting or throwing the ball above the net. A variation of this game as generally described in U.S. Patent Nos. 3,201,126, 3,256,021, and 3,312,471, is to have the net extend down to the bed and to have a hole in the net, with the object being to throw
25 the ball through the hole in the net rather than above the net.

These games, although offering fun and exercise, possess all of the serious injury potential of the trampoline alone. In fact, the dangers are probably
30 greater in that the players can easily become more concerned with the competitiveness of the game rather than their proximity to the edge of the trampoline bed.

Also known in the art is a device which consists of an inflated pneumatic cushion, the upper side of which is
35 enclosed by an inflated structure which serves as the walls and roof. The device is particularly designed for

children who enjoy walking about the soft cushion. This device offers an advantage over trampoline games in that there are no rigid supports which can cause injury. However, it suffers the disadvantage in that the rebound 5 factor of the cushion is much less than that of a trampoline bed, being only about 10% for an average adult.

The disclosed invention is a significant improvement over past devices in that it offers the safety of the pneumatic cushion devices while offering the rebound 10 factor of the trampoline.

The disclosed invention is a structure in which one or more persons can exercise. The invention also includes a method for playing a ball game within the exercise structure. The structure includes a rebound surface, such 15 as a trampoline bed, which acts as a springboard for the user and is supported above the ground. The rebound surface has a rebound factor of at least 20%, preferably at least 30% and optimally at least 50%. The air space above the surface is enclosed to form a cell of a 20 sufficient size to permit at least one person to exercise within the cell.

The highly beneficial exercise, mentioned above, can be obtained with the apparatus of this invention without the dangers normally encountered in the standard 25 trampoline. This is due to the special construction of the disclosed inventive structure. Specifically, the structure has means for enclosing the air space above the rebound surface, which forms a cell within which the user can exercise. The cell is of the size suitable to enclose 30 at least one person and preferably at least four persons. The enclosing means is attached at or within the outer perimeter of the rebound surface or bed, thus making it virtually impossible for the user to fall off of the surface or encounter any foreign hard obstacles which 35 could cause injury. In short, one can enjoy all of the benefits of the exercise with a minimal risk of any injury.

According to the invention, there is provided an apparatus for use by one or more persons as an exercise or game device, comprising;

5 a substantially horizontal rebound surface upon which a person may jump;

 a support for said surface;

10 a flexible outer wall around said rebound surface to form an enclosure, said outer wall being positioned at, or within the perimeter of said rebound surface to deflect a person jumping upon said surface and to protect that person from being injured by falling from said surface or impacting said support, said enclosure further comprising flexible dividing means within said outer wall to divide said enclosure into at least two compartments and to inhibit a person jumping on said rebound surface in one of said compartments from entering an adjacent compartment;

15 a support structure, external to said outer wall; a resilient coupling connecting said dividing means and said external support structure to maintain said dividing means under tension;

20 said outer wall being connected to said dividing means to reduce the amount said wall can flex upon impact by the person jumping on the rebound surface.

25 Generally, the dividing means is substantially perpendicular to said outer wall and in the form of one or more walls preferably made from netting. The dividing wall or walls may be separated, i.e., discontinuous, at the center of the enclosure to allow for attachment of 30 connectors to maintain the separated parts of the dividing walls taut. The outer ends of the dividing walls are similarly held taut by the coupling to the support structure and the outer wall is preferably attached to that coupling so as to prevent the outer wall from being 35 bowed outwards too far beyond the perimeter of the rebound surface upon impact by a user to prevent that user from

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being injured by contact with rigid elements of the apparatus such as the support structure.

In a preferred embodiment, the enclosure has two dividing walls substantially perpendicular to each other,
5 dividing the enclosure into four compartments.

Typically, the enclosure is substantially rectangular and the external support structure comprises substantially vertical frame members at each corner of the enclosure, preferably with similar frame members aligned with the
10 outer ends of the dividing walls to support them by means of the resilient couplings.

The device also allows multiple users to exercise within the structure at the same time without fear of injury. Strong perpendicular restraining nets which
15 divide the cell into quadrants allow as many as four persons to use the surface at a time. A person in such a quadrant may safely exercise due to these restraining nets which prevent the users from injuring each other by entering another's quadrant. Additional restraining nets
20 could be added, to accommodate greater than four players, if desired.

Advantageously, the exercise structure provides individual rebound surfaces for each exercise quadrant. Providing individual rebound surfaces more completely
25 isolates the exercise quadrants and results in added safety to the players.

Another embodiment of the invention provides an apparatus for use by one or more persons as an exercise or game device, comprising:

- 30 a plurality of adjacent and flexible rebound surfaces upon which a person may jump;
- a support for said rebound surfaces;
- means for resiliently coupling the rebound surfaces to the support;
- 35 a flexible outer wall around said rebound surfaces to form an enclosure, said outer wall being

positioned within the perimeter of the rebound surfaces to deflect a person jumping on one of the rebound surface and to protect the person from being injured by (i) falling from the rebound surfaces, (ii) impacting the means for resiliently coupling the rebound surfaces to the support means, or (iii) impacting the support means;

flexible dividing means for dividing the enclosure into compartments corresponding to the plural rebound surfaces , the dividing means being positioned within the perimeter of the rebound surfaces to deflect a person jumping on one of the rebound surfaces and to protect the person from being injured by (i) entering an adjacent section, (ii) impacting the means for resiliently coupling the rebound surfaces to the support means, or (iii) impacting the support means.

Preferably this apparatus further comprises:

a support structure, external to said outer wall;
20 a resilient coupling connecting said dividing means and said external support structure to maintain said dividing means under tension;

said outer wall being connected to said dividing means to reduce the amount said wall can flex upon impact by the person jumping on the rebound surface.

This embodiment of the invention may also incorporate other features described above with respect to the other embodiment, as will be apparent from the following description.

30 Another aspect of the invention involves a ball game which is played within the exercise structure. The perpendicular restraining nets are again stretched across the cell, dividing the cell into four quadrants. Each player has his own quadrant. Two perpendicular game nets are also stretched across the cell above the restraining nets and in generally the same planes. A bouncing
35

volleyball-like game is then played in which a ball is hit or thrown above the game nets.

Optionally, a single exercise structure can provide for four players to cooperate and play one game, or can 5 allow four players to split and play two independent games. The game incorporates the essential elements of volleyball, rebounding in basketball, racquetball, tennis, ping-pong, and water polo.

Since the rebound surface has a large rebound factor, 10 the disclosed invention offers all of the exercise, excitement, and enjoyment of a trampoline. However, due to the fact that the air space of the rebound surface is enclosed within a protective cell, thereby avoiding the danger of a person falling off the surface or hitting a 15 rigid support member, and the fact that restraining nets prevent multiple players from injuring one another, the disclosed invention virtually eliminates the disadvantages of prior trampoline devices. A further advantage of the structure is its ease in manufacture which allows the 20 structure to be constructed at a much lower cost than that required for installing racquetball or tennis courts.

These and other features of the present invention are best understood through the following detailed description of the preferred embodiments which reference the drawings, 25 in which:

Figure 1 is a perspective view of a preferred embodiment of the entire exercise structure;

Figure 2 is a perspective view of a portion of the supporting frame and individual rebound surfaces of the 30 exercise structure of Figure 1, with the fabric (from other than the rebound surfaces) removed;

Figure 3 is a cutaway view of the individual rebound surfaces, restraining nets positioned within the inner perimeter of the rebound surfaces, game nets, and 35 supporting frame of the exercise structure of Figure 1;

Figure 4 is a partial perspective view of a wall portion of the exercise structure of Figure 1, showing means for attaching scoring apertures and a return ramp to the supporting frame;

5 Figure 5 is an enlarged view of a spring means for coupling selected portions of the restraining and game nets, restraining walls, and rebound surfaces to the supporting frame of the structure of Figure 1;

10 Figure 6 is an enlarged view of means for interconnecting various segments of the supporting frame of the structure of Figure 1;

Figure 7 is an enlarged cutaway view of means for coupling the individual rebound surfaces to the supporting frame, taken along line 7-7 of Figure 2;

15 Figure 8 is an enlarged cutaway view of the restraining and game nets, taken along line 8-8 of Figure 3;

Figure 9 is an enlarged view of means for interconnecting the restraining nets, taken along line 9-9
20 of Figure 8;

Figure 10 is an enlarged cutaway view taken along line 10-10 of Figure 1, showing a portion of the supporting frame and interconnections with the restraining walls and restraining nets;

25 Figure 11 is an enlarged side view, taken along line 11-11 of Figure 10, showing means for coupling the rebound surface, restraining wall, and restraining net to a central section of the supporting frame;

Figure 12 is an enlarged view, taken along lines 12-12
30 of Figure 1, showing means for coupling the rebound surface restraining wall, and restraining net is a corner section of the supporting frame.

Referring to Figure 1 and Figure 2, a preferred embodiment of the exercise structure is shown.

35 A rectangular metal frame system is generally referenced by the numeral 10, and supports individual

flexible rebound surfaces 12a, 12b, 12c and 12d (hereinafter referenced collectively as "rebound surfaces 12"). The rebound surfaces 12 have a rebound factor of at least 20%, preferably at least 30%, and optimally at least 5 50%. The rebound factor can be adjusted, and is determined in part by the number of springs 16 utilized to couple the rebound surfaces 12 to the support system 10, as described in detail in reference to Figure 5 and Figure 7. The air space above the rebound surfaces 12, and 10 within the frame system 10, is enclosed by fabric outer restraining walls 14. The restraining walls 14 form and define the rectangular exercise cell generally referenced by the numeral 15. The fabric utilized to form the restraining walls 14 is preferably a breather material, 15 that is, an open weave netting through which air easily passes, for example, nylon. A player enters the cell 15 through horizontal reinforced openings 18.

There are a number of problems inherent in providing a generally rectangular exercise structure such as the 20 embodiment of Figure 1. Most importantly, there must be included means for preventing substantial flexing of a horizontal length of the restraining walls 14. The restraining walls 14 of the present inventive rectangular structure are of substantial horizontal length and must 25 provide effective restraining of the players over the side length of the walls 14. Thus, the center, or middle, of the restraining wall 14 must be prevented from flexing so far as to not effectively deflect a player. The means for performing this function is described in detail below.

30 The frame structure 10 generally comprises a lower, rigid rectangular support frame 24, an upper rigid rectangular support frame 26, eight vertical support groups 28 which couple together the lower 24 and upper 26 support frames, and nine support frame 24 to a horizontal plane a set distance above the ground. The various lengths of the 35 support frame 10 can be fabricated of male-female joints as shown in Figure 6.

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As shown in Figure 1, the exercise cell 15 may include a roof which comprises a pitchback 100. The pitchback 100 is preferably formed of a somewhat elastic material and is mounted by a plurality of springs 102 to the support frame members 26a, 26b, 26c, and 26d. An additional pair of frame members 26e and 26f lend rigidity to the exercise cell 15 and extend above the pitchback 100 a distance such that a ball hitting the pitchback 100 will not normally cause contact between the pitchback 100 and the frame members 26e and 26f. The wall 14 also may include a pitchback 104 spring mounted between support frame members 26a, 26b, 26c, and 26d and a support frame member 106. Presence of the pitchbacks 100 and 104 causes a ball to rebound with greater velocity than would otherwise be possible.

The lower support frame 24 comprises outer perimeter support lengths 24a, 14b, 24c and 24d, and inner perimeter support lengths 24e and 24f. The lower support frame 24 resiliently retains the rebound surfaces 12 in the same horizontal plane as the lower support frame 24 by spring means 16 shown generally in Figure 2 and discussed in detail in reference to Figure 5 and Figure 7. Similarly, the upper support frame 26 comprises outer perimeter support lengths 26a, 26b, 26c and 26d, and interior cross-sectional support lengths 26e and 26f.

The eight vertical support groups 28 comprise four corner supports 28a and four center supports 28b. The vertical support groups provide means for securely supporting the restraining walls 14, and as explained below, the restraining nets 20 and game nets 22. In particular, the center support groups 28b cooperate with the restraining nets 20 to effectively prohibit the restraining walls 14 from flexing too far when impacted by a player.

The interior of the exercise cell 15 is shown in Figure 3. Within the cell 15 are four restraining nets

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20, and above them, two smaller vertically adjustable and mutually perpendicular game nets 22. The restraining nets 20 are positioned within the inner perimeter of the rebound surfaces so as to prevent a player from impacting
5 the springs 16 or the interior cross-sectional lengths 26e and 26f of the lower support frame 26. Referring additionally to Figure 4, a first aperture 21 and a second aperture 23 are shown through the restraining walls 14. A fabric ramp 25 is coupled to the exterior of the walls 14
10 over the apertures 21,23. The fabric ramp 25 is coupled at its four corners by springs 16 to cross member supports 51,53 spanning from the center support group 28b to the corner support group 28a. Each of the quadrants formed by the restraining nets 20 and the restraining walls 14 is
15 provided with the apertures 21,23 and the ramp 25. The restraining nets 20 and game nets 22 are coupled to the restraining walls 14 and to the center support groups 28b as described in detail below in reference to Figure 10 and Figure 11.

20 Shown in Figure 5 is a preferred means for coupling the springs 16 to a portion of the supporting frame 10. Each spring 16 is coupled at one end to a D-ring 13. The D-ring 13 is coupled to various portions of the restraining walls 14 restraining nets 20, game nets 22,
25 and the perimeter edges of rebound surfaces 12. The other end of the spring 16 is hooked to a coupling rail 17, which is permanently mounted to the inner face of the various lengths of the support frame 10.

To overcome the need to frequently replace worn
30 springs 16 and to further increase the rebound factor of the rebound surfaces 12, a particular means for fastening the rebound surfaces 12 to the lower support frame 24 is incorporated in the preferred embodiment and is shown in Figure 7. A plurality of D-rings 13 are coupled to a set
35 distance apart to a perimeter edge of the individual rebound surfaces 12a, 12b, 12c and 13d. Each vertical

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face of the inner perimeter support members 24e and 24f are fitted with the coupling rails 17. Depending on the size of the players involved in the game, a selected number of the D-rings 13 can be fitted with two springs 16 as opposed to utilizing only one spring 16. Thus, if older and heavier players are involved, or a greater rebound factor is desired, additional springs 16 can be added to further support the rebound surfaces 12. It is important that when springs 16 are added to D-rings 13 along one edge of a rebound surface 12, the same number of springs 16 must be added in to corresponding D-rings 13 along the opposite edge of the same rebound surface 12, thereby assuring proper balancing and even stress distribution along the rebound surface 12 and lower support frame 24.

Greater safety is achieved by utilizing individual rebound surfaces 12 as compared to a single rebound surface as described in the prior art. In an exercise structure which incorporates a single rebound surface when numerous players are simultaneously impacting the rebound surface, great amounts of stress are put on the springs 16 and support frame 10. In addition when numerous players are impacting the rebound surface at different times, it is impossible to know exactly where any particular player will impact the rebound surface. It is possible for a particular player to be expecting contact at a specific instant, but due to the effect on the whole rebound surface of another player's impact, the particular player may unexpectedly impact the rebound surface either an instant earlier or later than originally planned. As a result, it is possible to sustain ankle and knee injuries due to unexpected impact with the rebound surface. It is therefore preferred in this invention to use multiple rebound surfaces. By providing individual rebound surfaces 12a, 12b, 12c and 12d, the impact of one player on rebound surface 12a, for example, will have no effect

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on when the other players will impact rebound surfaces 12b, 12c or 12d. Thus, the preferred embodiment provides a much greater degree of safety in comparison to known prior art.

5 As mentioned above, the restraining nets 20 separate the playing cell into four quadrants. Each quadrant corresponds to an individual rebound surface 12a, 12b, 12c or 12d. The restraining nets 20 are coupled at the perimeter of the cell 15 to the center support groups 28b
10 through the restraining walls 14 as shown in Figure 10 and Figure 11 and described below in reference thereto. In addition, each net 20 is fitted with D-rings 13 along a vertically reinforced center as shown in Figure 8 and Figure 9. A plurality of tension straps 29 are inserted
15 through corresponding D-rings 13 along the vertical length of each restraining net 20. Each tension strap 29 is then fastened together at its ends to pull the nets 20 taut to form the individual exercise quadrants. Thus, each net is restrained at its ends by the center support groups 28b as
20 described below, and at its center by the tension straps 29.

Shown in Figure 10 and Figure 11 is means for coupling the restraining nets 20 to the center support groups 28b through the restraining walls 14. As shown broadly in
25 Figure 1, and more particularly in Figure 10, the center support groups 28b comprise a pair of vertical support members 28b, and 28b₂. Each vertical member 28b, 28b₂ is aligned along the same vertical plane as the opposing restraining nets 20. The restraining nets 20 are
30 reinforced along their edges to facilitate secure attachment of hooks 33 at set intervals along the edge of the nets 20. At intervals corresponding to those of the hooks 33, and in the same vertical plane as the restraining nets 20 and the corresponding center support
35 28b₁ or 28b₂, O-rings 13a are inserted through slits in the restraining walls 14. The slits are reinforced with

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strapping 35 to prevent the O-ring 13a from being pulled through the restraining walls 14. As can be seen clearly in Figure 7, the O-rings 13a extend through to both the interior and exterior of the restraining walls 14. Hooks 5 33 of the restraining nets 20 are coupled to the O-rings 13a at the interior of the restraining walls 14. Springs 16 are coupled at one end to the O-rings 13a at the exterior of the restraining walls 14, and at the other end to the coupling rails 17 of the center support groups 28b.

10 Since the restraining nets 20 are pulled taut at the center of the exercise cell 15 by tension straps 29, coupling the nets 20 to the O-rings 13a of the restraining walls 14 serves to prevent the center portion of the walls 14 from flexing outward at such a great degree as to be 15 ineffective for restraining a player who has impacted the wall 14. Further, coupling the O-rings 13a of the walls 14 to the center support groups 28b provides the tension necessary to prevent the restraining nets 20 from flexing too great of an amount to be effective for restraining a 20 player who has impacted the net 20.

Referring again to Figure 11, it is readily apparent that, the restraining walls 14 are positioned well within the perimeter of the edge of the rebound surfaces 12, thereby assuring that a player cannot impact or become 25 entangled in the support frame 10 or springs 16.

Referring to Figure 12, the corner vertical support group 28a is shown providing the required support for the corners of the restraining walls 14. The walls 14 are reinforced along the vertical length of the center to 30 facilitate secure fastening of D-rings 13 to the walls 14. Springs 16 are coupled at one end to the D-rings 13, and at the other end to the corner support groups 28a to securely hold the restraining walls 14. Thus, each quadrant of the cell 15 is bounded by the restraining nets 35

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20 at the interior and by the restraining walls 14 at the exterior.

Thus, a tension equilibrium is achieved between the restraining nets 20 and the restraining walls 14, caused
5 by the tension straps 29 and the spring 16 coupled to the center support groups 28. The effect is to prevent a flexible restraining wall or net of substantial horizontal length from flexing upon impact around the midpoint of the length.

10 The exercise cell 15 which has been described in reference to the preferred embodiment, is not only safe and suitable for exercise, but also is suitable for playing an inventive ball game which will now be described.

15 The ball game can be played one-against-one, i.e., singles, two-against-two, i.e., doubles, and also by three or four individuals each playing for themselves. The game will be described in terms of singles and doubles. However, obvious variations will be apparent from these
20 descriptions.

A 14-inch diameter, light game ball, similar to a volleyball, is used. It is also possible to use a special 6-pound medicine ball for exercising and timing only. The object of the game is to hit or pass a ball back and forth
25 over the game nets 22 without permitting it to touch the rebound surfaces 12. The players attempt to place the ball into the opposing court in a position which makes it difficult for the opponents to return it.

All players stand still anywhere in their quadrants to
30 begin the game, whether it be singles or doubles. The server may stand any place in his quadrant that he chooses. He may serve with no bounce, or he may serve with one bounce, that is, he may bounce into the air from a dead stand as long as the ball leaves his hand before he
35 again contacts the rebound surface '12. All other players may begin motion only after the ball leaves the server's

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hand. If the server does not clear the net 22 and the ball falls back into his court, it is called a miss, and the other side scores one point. It is permissible on service and during play for the ball to hit the 5 restraining walls 14 surrounding the rebound surfaces 12.

A player may not at any time touch the game net 22 or any portion of the restraining net 20 below it. If he does so, his opponent gains a point. When spiking the ball at the apex of his bounce, a player's hands may not 10 go beyond the vertical plane of the game net 22.

In singles play, each player occupies one quadrant of space. The game is preferably played parallel rather than diagonally. In singles, scoring only occurs as described above with respect to the service and when one player 15 allows the ball to strike the rebound surfaces 12 or he is unable to return it within one bounce of his body against the rebound surface. If a player catches the ball while his feet are in contact with the rebound surface, he may go into the air and contact the rebound surface once. 20 Then he must release the ball. If the rebound surface is contacted twice from an aerial position, it is considered a miss, and the opposing player gains one point.

In doubles play, the area of play consists of all four quadrants, each player occupying one quadrant. The game 25 is played both diagonally and in parallel. With respect to serving, Server No. 1 of Team A is allowed two serves after which the ball goes to Server No. 1 of Team B. After two serves, the ball goes to Server No. 2 of Team A who serves twice and then relinquishes the ball to Server 30 No. 2 of Team B. The cycle is then repeated until there is a winner. Either side may score whether they are server or receiver. Scoring only occurs from a miss in serving, i.e., two fouls, and when a player allows the ball to strike the rebound surfaces 12 or he is unable to 35 return it within two bounces of his or his teammate's body against the rebound surfaces 12. Each team therefore has

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two bounces to return the ball. The bounces can be taken by one team member or the ball may be passed to the teammate and split between the two players. If a player catches a ball while his feet are in contact with the
5 rebound surface, he may go into the air and he or his teammate may contact the rebound surface two more times before passing the ball. If the rebound surface is contacted three times from an aerial position, it is considered a miss and the opposing team gains a point.

10 Another aspect of a ball game which can be played by one or more players and is best shown in Figure 11 involves attempting to throw a ball through a first aperture 21 in the restraining walls 14. If a player is successful in the toss, the ball is guided by a ramp 25 to
15 a second aperture 23 located below the first aperture 21. The ball then passes through the second aperture 23 and is returned to the cell 15. The ramp 25 can be made from the same type of breather fabric material as is the restraining walls 14 and may be attached to the
20 restraining walls 14 by sewing or any other convenient method which is apparent to those of ordinary skill.

It is noted that one could easily adapt the exercise cell of Figure 1 to provide only two opposing exercise halves instead of quadrants. In such a configuration,
25 only two rebound surfaces 12 would be employed instead of four as shown in Figure 2. In addition, only two restraining nets 20 would be required.

Further, one could provide a single rectangular rebound surface 12 with the restraining walls 14 and a
30 single restraining net 20 and game net 22 as disclosed in the preferred embodiment. In such a manner, the restraining walls 14 could effectively be prevented from flexing at too great a degree proximate the restraining nets 20.

CLAIMS

1. An apparatus for use by one or more persons as an exercise or game device, comprising;
 - 5 a substantially horizontal rebound surface upon which a person may jump;
 - a support for said surface;
 - 10 a flexible outer wall around said rebound surface to form an enclosure, said outer wall being positioned at, or within the perimeter of said rebound surface to deflect a person jumping upon said surface and to protect that person from being injured by falling from said surface or impacting said support, said enclosure further comprising flexible dividing means within said outer wall to divide said enclosure into at least two compartments and to inhibit a person jumping on said rebound surface in one of said compartments from entering an adjacent compartment;
 - 15 a support structure, external to said outer wall;
 - 20 a resilient coupling connecting said dividing means and said external support structure to maintain said dividing means under tension;
 - 25 said outer wall being connected to said dividing means to reduce the amount said wall can flex upon impact by the person jumping on the rebound surface.
2. An apparatus as claimed in Claim 1 wherein said dividing means is substantially perpendicular to said outer wall.
3. An apparatus as claimed in Claim 1 or 2, wherein said dividing means is separated at the center of the 30 enclosure and held there by connectors to maintain the separated parts of the dividing means taut.
4. An apparatus as claimed in Claim 1, 2 or 3, wherein said outer wall is attached to said coupling.
- 35 5. An apparatus as claimed in any of Claims 1-4, wherein said coupling comprises a plurality of springs.

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6. An apparatus as claimed in Claim 5, wherein said springs are connected to said dividing means by rings attached to said dividing means.

7. An apparatus as claimed in any of Claims 1-6,
5 wherein said dividing means comprises at least one dividing wall.

8. An apparatus as claimed in Claim 7, wherein said dividing means comprises two dividing walls substantially perpendicular to each other.

10 9. An apparatus as claimed in Claim 8, wherein each of said dividing means have layers spaced apart from one another.

10. An apparatus as claimed in any of Claims 1-8, having game netting above and in alignment with said 15 dividing means so that a ball can be passed over said netting from one compartment to another.

11. An apparatus as claimed in any of Claims 1-10, wherein said enclosure is substantially rectangular and said external support structure comprises substantially 20 vertical frame members at each corner of the enclosure.

12. An apparatus as claimed in Claim 11, wherein said rebound surface support comprises a lower frame resiliently coupled to said surface and said vertical frame members and holding said surface is a substantially 25 horizontal plane;

said apparatus further comprising:

a plurality of legs attached to said lower frame to maintain said rebound surface above ground level;
and

30 an upper support frame connected to said vertical frame members to stabilize said vertical frame members.

13. An apparatus as claimed in Claim 11, wherein said enclosure is substantially rectangular and said external 35 support structure comprises substantially vertical frame members at each corner of the enclosure, said frame members being supported by said rebound surface support.

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14. An apparatus as claimed in Claim 13 wherein said corner frame members are connected to corresponding corners of said outer wall by resilient couplings to securely hold said outer wall taut in said rectangular configuration.

5 15. An apparatus as claimed in Claim 14, wherein each corner resilient coupling comprises a plurality of springs connected to said outer wall by rings attached to one corner of said outer wall.

10 16. An apparatus as claimed in any of Claims 1-15, wherein each compartment has an individual rebound surface spaced apart from the rebound surface of an adjacent compartment.

15 17. An apparatus for use by one or more persons as an exercise or game device, comprising:

a plurality of adjacent and flexible rebound surfaces upon which a person may jump;

a support for said rebound surfaces;

20 means for resiliently coupling the rebound surfaces to the support;

a flexible outer wall around said rebound surfaces to form an enclosure, said outer wall being positioned within the perimeter of the rebound surfaces to deflect a person jumping on one of the rebound surfaces and to protect the person from being injured by (i) falling from the rebound surfaces, (ii) impacting the means for resiliently coupling the rebound surfaces to the support means, or (iii) impacting the support means;

25 30 35 flexible dividing means for dividing the enclosure into compartments corresponding to the plural rebound surfaces, the dividing means being positioned within the perimeter of the rebound surfaces to deflect a person jumping on one of the rebound surfaces and to protect the person from being injured by (i) entering an adjacent section, (ii)

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impacting the means for resiliently coupling the rebound surfaces to the support means, or (iii) impacting the support means.

18. An apparatus as claimed in Claim 17 further
5 comprising:

a support structure, external to said outer wall;
a resilient coupling connecting said dividing means and said external support structure to maintain said dividing means under tension;

10 said outer wall being connected to said dividing means to reduce the amount said wall can flex upon impact by the person jumping on the rebound surface.

19. An apparatus as claimed in Claim 18, wherein said dividing means is separated at the center of the enclosure
15 and held there by resilient connectors to maintain the separated parts of the dividing means taut.

20. An apparatus as claimed in Claim 18 or 19,
wherein said outer wall is attached to said coupling.

21. An apparatus as claimed in any of Claims 18-20,
20 wherein said dividing means comprises at least one dividing wall.

22. An apparatus as claimed in Claim 21, wherein said dividing means comprises two dividing walls substantially perpendicular to each other.

25 23. An apparatus as claimed in Claim 22, wherein each of said dividing means have layers spaced apart from one another.

24. An apparatus as claimed in any of the Claims 18-
23, having game netting above and in alignment with said
30 dividing means so that a ball can be passed over said netting from one compartment to another.

25. Use of an apparatus according to any preceding claim for exercise or in the playing of a game.

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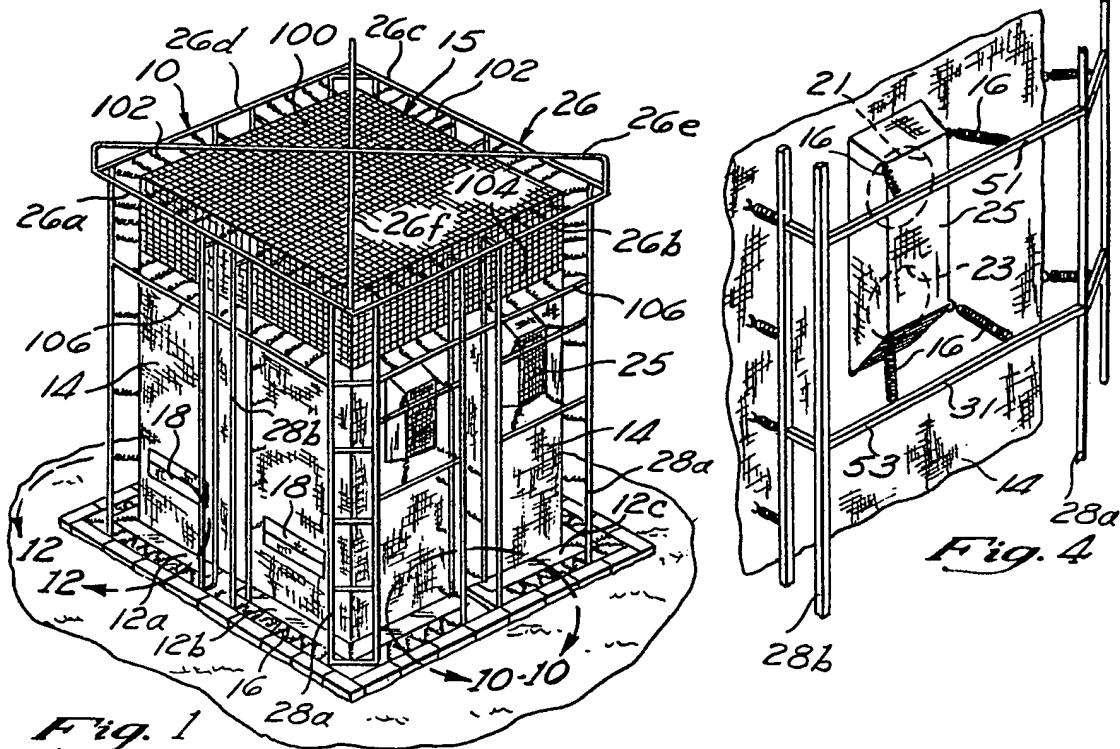


Fig. 1

Fig. 4

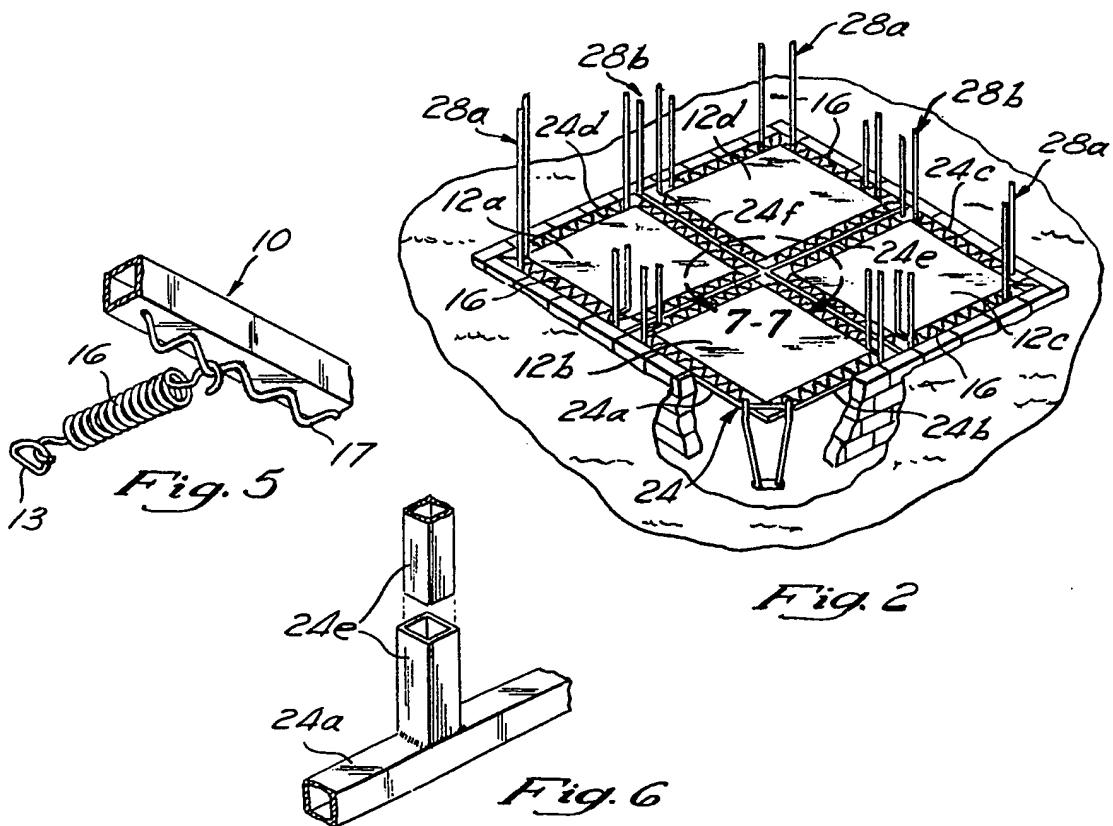


Fig. 2

Fig. 5

Fig. 6

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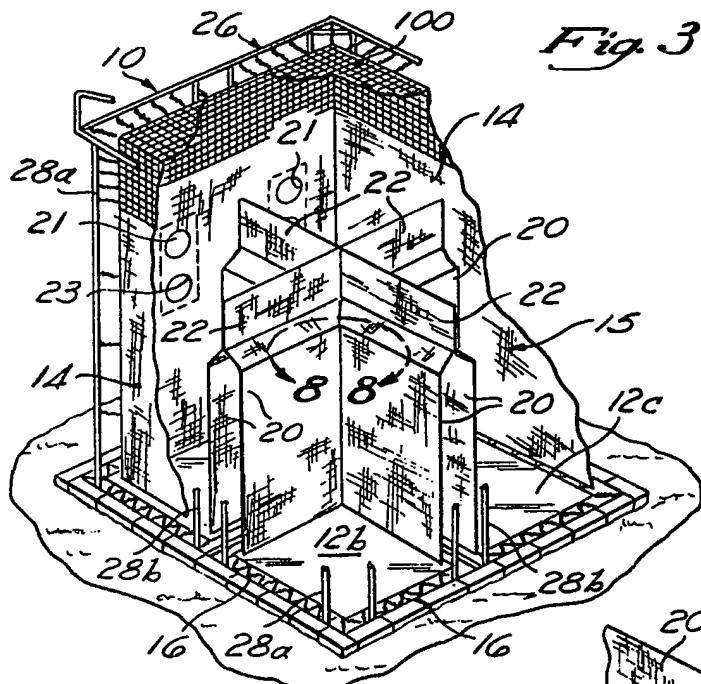


Fig. 3

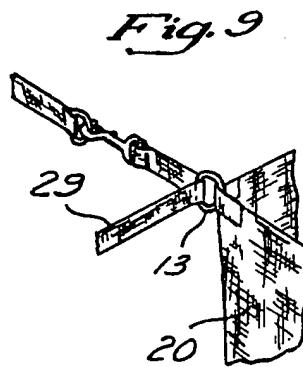


Fig. 9

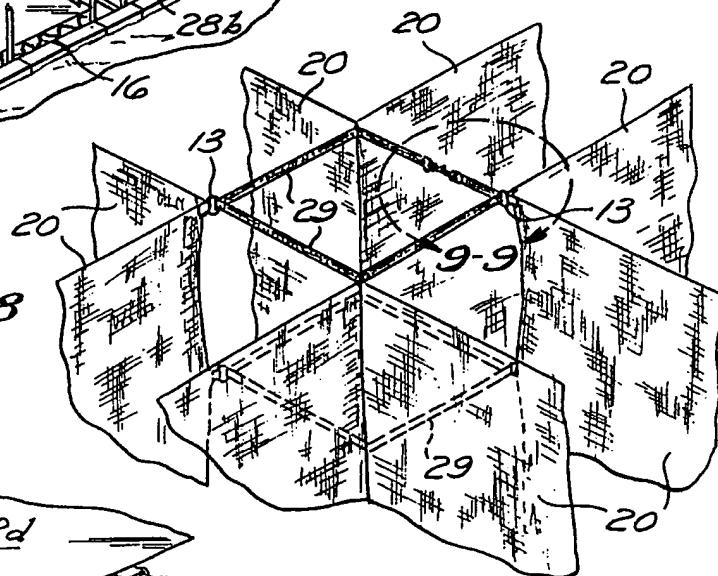


Fig. 8

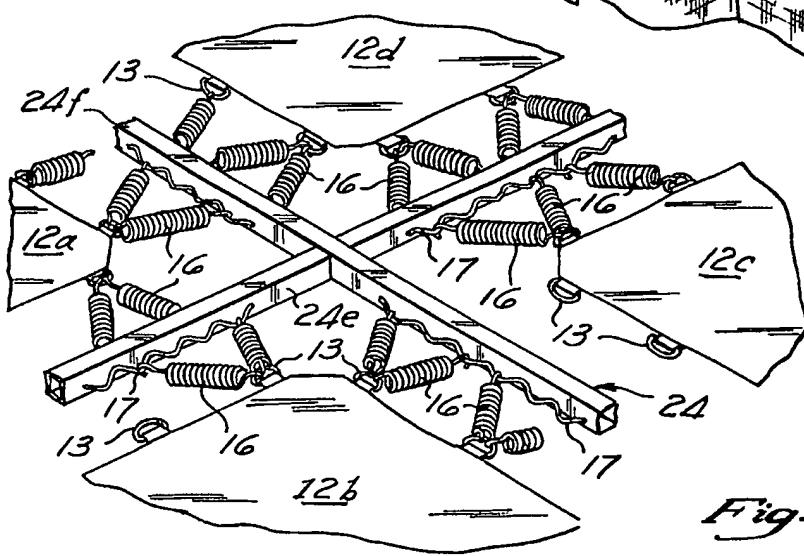
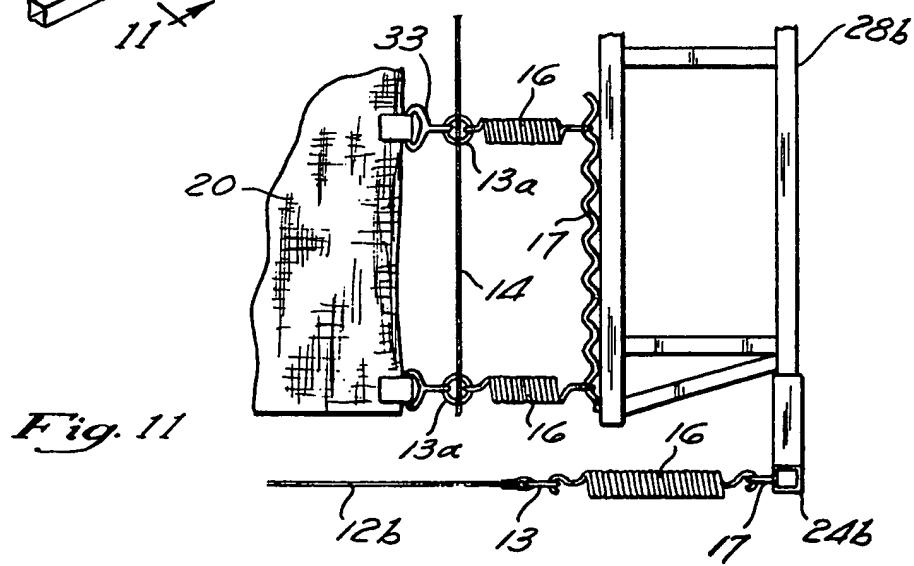
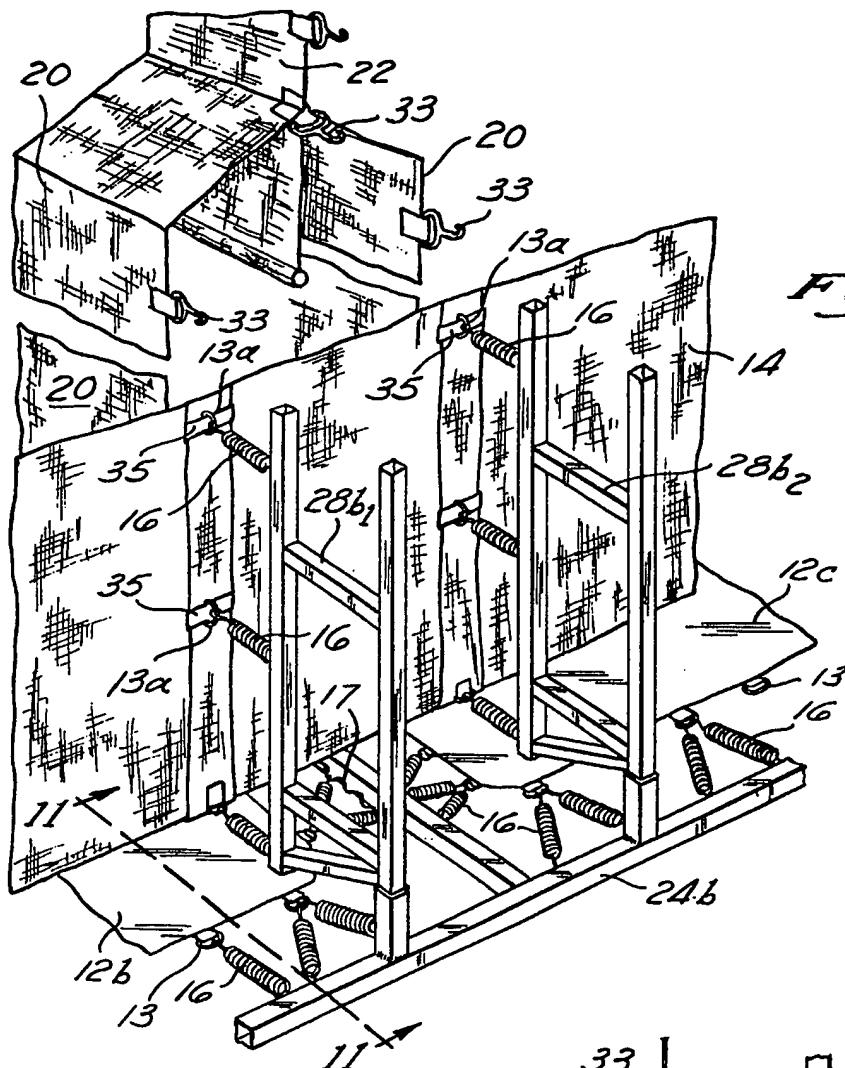


Fig. 7

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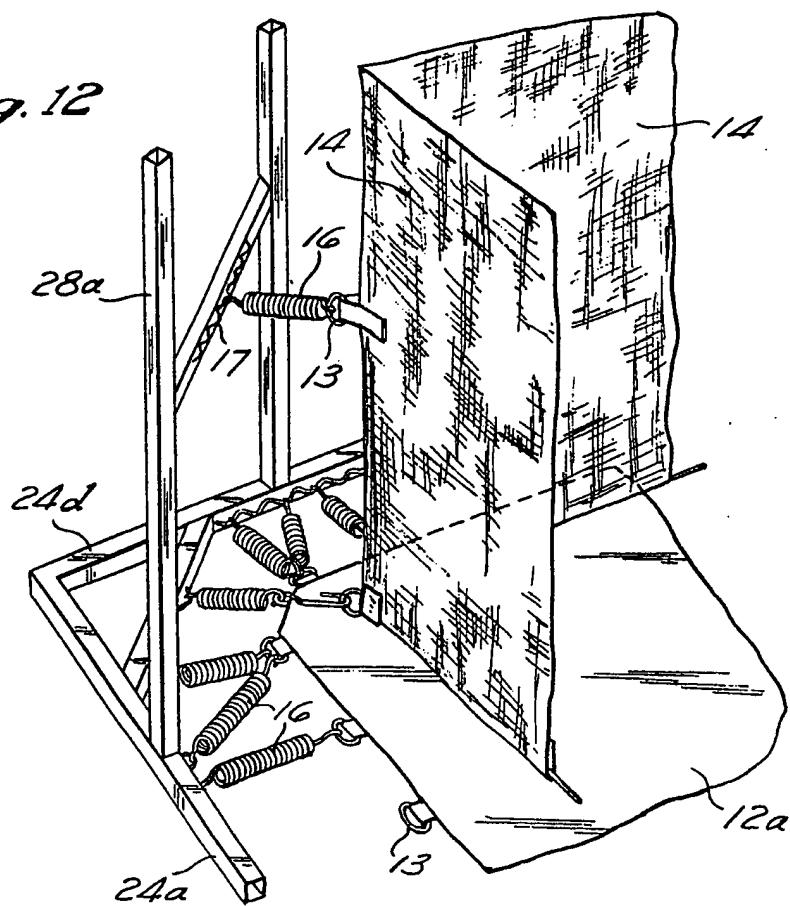
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Fig. 12





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EUROPEAN SEARCH REPORT

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Application number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 83306235.9
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ?)
X	GB - A - 2 050 178 (PLM PATENT-LIZENZ-MITTNER GMBH) * Abstract; fig. 1-11 * --	1,2,4, 7,8, 10,17, 25	A 63 B 5/08 A 63 B 69/00 A 63 B 71/04
A	GB - A - 1 084 569 (NISSEN CORPORATION) * Fig. 1; pages 3,4 * --	1,17	
A	US - A - 4 077 623 (CLAUSELL) * Abstract; fig. 1 * -----	1,17	
TECHNICAL FIELDS SEARCHED (Int. Cl. ?)			
			A 63 B 5/00 A 63 B 69/00 A 63 B 71/00
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
VIENNA	20-12-1983	SCHÖNWÄLDER	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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